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## **REMARKS**

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office action, and amended as necessary to more clearly and particularly describe the subject matter which applicant regards as the invention.

Claims 1-3, 5, and 8-9 are now presented for examination. Claims 4 and 6-7 have been withdrawn. Reconsideration of the application in its present form is requested.

More particularly, claim 1 has been amended to more clearly specify that the groove cross section shape is a half-sinusoidal wave. Similarly, claim 3, which has been rewritten in independent format, has been amended to specify that the groove cross section shape is a half sawtooth wave. Claim 5 has likewise been amended to more clearly define the groove shape. Claims 8 and 9, which are substantially identical to claim 2 in content, have been added and depend from independent claims 3 and 5, respectively.

Claims 1, 3 and 5 stand rejected as being anticipated by any of Iida et al. Okayama et al. Negishi, or Genovese. For the following reasons, the Examiner's rejections are traversed.

### **IIDA ET AL.**

The Iida et al. patent (US 5,007,709) is directed toward a diffraction grating wherein the groove profile is distorted from the sinusoidal groove profile. In this regard, see Col. 6, lines 30-34, referring to Fig. 5; and Col. 6, lines 43-48 referring to Fig. 7. Accordingly, with reference to claim 1, it is clear that Iida et al. does not

contemplate or suggest a groove having a cross section shape formed as "a half sinusoidal wave", as required. Rather, lida teaches away from this feature of the claimed invention.

With reference to claim 3, lida et al. does not disclose or suggest forming the groove so as to have a cross section shape formed as a "half sawtooth wave", as required. Clearly, lida et al. does not contemplate forming the groove in the manner required by claim 3.

With regard to claim 5, the foregoing comments regarding the deficiencies of lida et al. are considered to be equally applicable and will not be repeated.

Based upon the foregoing, it is considered apparent that lida et al. does not anticipate or render obvious the subject matter defined in pending claims 1, 3, and 5. Reconsideration and withdrawal of the rejections based upon lida et al. is requested.

#### **OKAYAMA ET AL.**

The Okayama et al. patent (US 5,280,388) is directed toward an optical low-pass filter that is formed from a multi-layer structure and is adapted to generate a phase difference at a boundary of the layers. The layers are selected so as to have, at a selected wavelength, the same refractive index while having different refractive index dispersions.

With reference to Fig. 2, Okayama teaches a layer 8 on the object side, a layer 9 on the image side, and structure 10 for generating a phase difference at the boundary of the two layers 8, 9. The structure 10 is only shown schematically in Fig. 2 and Fig. 8, and the only disclosure regarding the shape or configuration of the structure 10 is provided in Fig. 3 (triangular) and Fig. 4 (trapezoidal). In this regard, reference should be made to Col. 4, lines 12-53. Fig. 5 shows the result when the

structure 10 according to Fig. 3 is used, and Fig. 6 shows the result when the structure 10 according to Fig. 4 is used. Figs. 7 and 8 schematically illustrate different ways to orient or align the structures of Figs. 3 and 4. In this regard, see Col. 5, lines 30-40.

Accordingly, with reference to claim 1, the Okayama patent does not teach or suggest that the groove cross section shape is a half sinusoidal wave. Rather, Okayama only teaches a groove having a triangular or trapezoidal cross section shape.

Further, with reference to claims 2 and 8, Okayama does not teach a duty ratio of a groove width to a groove cycle of the grating is 0.5. Rather, it is believed that Okayama advocates a much different duty cycle (See Fig. 4).

With reference to claim 3, the Okayama patent does not teach or suggest that the groove cross section shape is a half sawtooth wave, as required. Further, as noted above, the Okayama patent does not teach the required duty ratio.

With regard to claim 5, and claim 9 that depends therefrom, it is considered apparent that foregoing comments regarding the deficiencies of Okayama as relates to claims 1-3 and 8 are equally applicable.

Based upon the foregoing, it is considered apparent that Okayama et al. does not anticipate or render obvious the subject matter defined in pending claims 1-3, 5 and 8-9. Reconsideration and withdrawal of the rejections based upon Okayama et al. is requested.

### **NEGISHI**

The Negishi patent (US 4,670,095) is directed toward a method for forming partial films on uneven surfaces, such as a Fresnel lenses. As part of the

disclosure, Negishi explains, in Fig. 9, application of a photosensitive film 10 to an irregular surface, which is described as being "corrugated". The photosensitive film 10 is selectively developed or exposed to light so to provide unexposed portions 10a and exposed portions 10b. The exposed portions 10b are etched away so as to reveal the subjacent surface.

With regard to the present application, it is apparent that the disclosure and teaching of Negishi is irrelevant to the claimed invention. Notably, the Negishi patent is solely directed toward applying films to selective portions of an irregular surface. It is considered apparent that the present invention is directed toward a different field, and that the "grating" of the present invention could not be derived from the Negishi teachings.

Nevertheless, with reference to claim 1, Negishi does not teach or suggest a grating having a groove wherein the groove cross section shape is a half sinusoidal wave. As noted above, Negishi does not teach a grating. Moreover, the surface structure of Negishi is not a half sinusoidal wave, as required. Further, with reference to claims 2 and 8, Negishi does not teach a duty ratio of a groove width to a groove cycle of the grating is 0.5. In this regard the Examiner is asked to refer to Fig. 9 of Negishi and note the close spacing of the "grooves".

With reference to claim 3, the Negishi patent does not teach or suggest that the groove cross section shape is a half sawtooth wave, as required. Further, as noted above, the Negishi patent does not teach the required duty ratio.

With regard to claim 5, and claim 9 that depends therefrom, it is considered apparent that foregoing comments regarding the deficiencies of Negishi as relates to claims 1-3, and 8 are considered to be equally applicable.

Based upon the foregoing, Negishi et al. does not anticipate or render

obvious the subject matter defined in pending claims 1-3, 5, and 8-9.

Reconsideration and withdrawal of the rejections based upon Negishi et al. is requested.

## **GENOVESE**

The Genovese patent (US 5,291,318) is directed toward a grating for use in a laser printer, scanner, etc. The grating, which is referred to as a kinogram in the Genovese patent, has a series of grating lines G formed thereon. Although the cross section shaped of the grating lines is not stated in the Genovese patent, the grating lines G in Figs. 3A-3C appear to be semi-circular in cross section. It is noted that the grating lines G are relatively far apart from one another as compared to the width dimension of each grating line.

With reference to claim 1, Genovese does not teach or suggest a grating having a groove wherein the groove cross section shape is a half sinusoidal wave. As noted above, the surface structure of Genovese is not a half sinusoidal wave, as required.

Further, Genovese does not teach a duty ratio of a groove width to a groove cycle of the grating is 0.5, as required by claims 2 and 8. In this regard the Examiner is asked to refer to Figs. 3A-3C of Genovese and note the distance between the grating lines G.

With reference to claim 3, the Genovese patent does not teach or suggest that the groove cross section shape is a half sawtooth wave, as required. Further, as noted above, the Genovese patent does not teach the required duty ratio.

With regard to claim 5, and claim 9 depending therefrom, it is considered

apparent that foregoing comments regarding the deficiencies of Genovese as relates to claims 1-3 and 8 are considered to be equally applicable.

Based upon the foregoing, it is considered apparent that Genovese does not anticipate or render obvious the subject matter defined in pending claims 1-3, 5, and 8-9. Reconsideration and withdrawal of the rejections based upon Genovese is requested.

With reference to claims 2 and 8-9, the Examiner has taken the position that it would have been obvious to one of ordinary skill in the art to evenly space the grooves and/or bottom part for the purpose of diffracting light as desired therefrom. Based upon this conclusion, the Examiner has determined that the claimed duty ratio would have been obvious.

In support of this proposition, the Examiner has cited Negishi, Col. 6, lines 38-52 and Genovese, Col. 7, lines 33-46 as teaching that "it is known in the art to for a grating with a desired spacing of the grooves in order to control the degree of diffraction." These portions of the references have been reviewed.

The portion of Negishi referenced by the Examiner pertains to the relationship between Fresnel lenses and light source. The portion of Genovese cited by the Examiner pertains to adjusting the shape of scattering center profiles so that most of the energy is directed toward a single diffraction order. It is not clear to the undersigned how these portions of the references are relevant to the claimed invention or how they support the proposition for which the Examiner has cited them. Clarification is requested.

It is respectfully submitted that while various duty ratios may be known in the art, it is nevertheless not obvious, in the invention defined in claims 1, 3 and 5, to provide a specific duty ratio of 0.5.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 18-0160, our Order No. NGB-12833.

Respectfully submitted,

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